

Sign Language to Speech Conversion

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Abstract: Human communication relies heavily on verbal and non-verbal cues, with sign language serving as a crucial method of interaction for individuals with hearing impairments. However, the communication barrier between sign language users and those unfamiliar with it remains a significant challenge. This paper presents an innovative approach to bridging this gap through an Arduino-based system that converts sign language gestures directly into speech without the use of a camera. By utilizing flex sensors and an accelerometer, this system detects hand gestures and movements, processes this data, and produces corresponding audio output. This approach offers a more accessible and portable solution compared to traditional camera-based systems, potentially revolutionizing real-time communication for the deaf community. The experimental results demonstrate a gesture recognition accuracy of 92% and a response time of under 500 milliseconds, indicating the system's viability for practical applications

Keywords: Sign Language Recognition, Arduino, Gesture Recognition, Assistive Technology, Speech Synthesis